

ACULEATA HYMENOPTERA OF SAND MOUNTAIN AND BLOW SAND MOUNTAINS, NEVADA

R. W. Rust¹, L. M. Hanks,^{1,2} and R. C. Bechtel³

ABSTRACT.— There were 198 species of aculeate Hymenoptera in 15 families collected from Sand Mountain and Blow Sand Mountains, Nevada. Four species are considered new to science and none are considered endemic to either dune area.

Sand Mountain and Blow Sand Mountains were visited 19 times in a 13-month period for the purpose of surveying selected groups of arthropods. Here we report on the aculeate Hymenoptera collected during the study. Over 2,000 specimens were obtained, representing 198 species in 15 families. Four species are considered new to science and 21 species were identified as "species" in unstudied genera. Most of the unknown species were bees (Apoidea) in the genera *Perdita*, *Dialictus*, *Sphecodes*, and *Hesperapis*. None of the species is considered sand obligate or endemic to either dune.

Previous studies on Hymenoptera in Nevada include the faunistic inventory of the Nevada Test Site conducted by Brigham Young University from 1958 to 1966 that produced almost 8,000 adults and 1,100 immatures (Beck and Allred 1968). Of these, the ants (Cole 1966), mutillid wasps (Ferguson 1967, Allred 1973), tephritid wasps (Wasbauer 1973), and bees (G. E. Bohart, pers. comm.) have been identified. Wheeler and Wheeler (1978) studied the mountain ants of Nevada and they have produced a manuscript on the ants of Nevada (to be published by Los Angeles County Museum). Pretruszka (1980) obtained almost 2,000 specimens, identified to family, from Fairview Valley, Nevada, from pitfall and malaise trapping.

STUDY SITES

Sand Mountain (SM) dunes and Blow Sand Mountains (BSM) dunes were sampled from

June 1979 through July 1980. Sand Mountain is approximately 46 km ESE of Fallon, Churchill County, Nevada (39°20'N–118°20'W) and is about 1,250 m in elevation. Blow Sand Mountains are approximately 52 km SE of Fallon, Nevada (39°10'N–118°35'W) and are about 1,400 m in elevation. The dunes are separated by 25 km air distance. Sand Mountain is a star dune of approximately 3.2 km² and Blow Sand Mountains are complex star and linear dunes of approximately 9.2 km². However, both dunes result from the same eolian sand deposited during the Turupah and Fallon formations of about 4,000 years B.P. (Morrison and Frye 1965).

The floras of the two dunes were similar. The dominant vegetation was *Atriplex confertifolia* (Torr. & Frem.), *Tetradymia tetrameres* (Blake), *Chrysothamnus viscidiflorus* (Hookl), *Astragalus lentiginosus* Dougl., and *Psoralea lanceolata* (Pursh.), and at Sand Mountain only *Eriogonum kearneyi* Tidestr. and *Psorothamnus polyadenius* (Torr.). The common grass was *Oryzopsis hymenoides* (R. & S.).

METHODS

Several collecting techniques were used to obtain specimens (see Bechtel et al. 1981). Permanent pitfall traps were 0.95 L plastic cartons. They were operative for 30-day periods. Temporary pitfall traps were 15 cm diameter cereal bowls placed level with the sand surface. Temporary pitfall traps were

¹Biology Department, University of Nevada, Reno, Nevada 89557.

²Present address: Department of Entomology, University of Maryland, College Park, Maryland 20742.

³Nevada State Department of Agriculture, 350 Capitol Hill Avenue, Reno, Nevada 89502.

used for 12–18 hr during a survey period. Two UV light traps were operated from dusk to dawn. Hand-held UV lamps were used in searching the dunes for fluorescing arthropods. Sand was sifted through two screens 12 × 12 cm and 1.5 × 1.5 cm mesh to recover subsurface arthropods. General collecting involved the use of aerial nets, plant inspection, and walking the dunes at night with lamps to obtain specimens. During a survey period, four or five different sites on the dune were visited and the sites were varied each survey period.

Data are presented in the following manner: For each species its known geographic distribution, present location, numbers obtained, dates of occurrence, and, for the bees, their flower visitation as determined from pollen-load analysis (Hanks and Rust 1983). Once a genus and species of plant is given as a pollen source, subsequent references to it is by use of the first two letters of the genus and species, e.g. *Astragalus lentiginosus* is Asle. Geographic distributions were obtained from the Hymenoptera Catalog (Krombein and Hurd 1979) and are presented as North America (NA), western United States (WUS), southwestern United States (SWUS), Great Basin (GB), or by individual state. For the ants, Formicidae, the number given represents collections and not individual ants.

The following taxonomists identified the material being presented: R. C. Bechtel (Mutillidae), G. E. Bohart (Apoidea), R. M. Bohart (Chrysididae, Vespidae, Sphecidae), A. A. Grigarick (Megachilidae), L. Kimsey (Chrysididae), W. E. LaBerge (Apiodea), A. S. Menke (Sphecidae), F. D. Parker (Sphecidae), J. G. Rosen (Andrenidae), R. W. Rust (Apoidea), R. R. Snelling (Apiodea, Formicidae), R. W. Thorp (Andrenidae), M. S. Wasbauer (Tiphidae, Scoliidae, Pompilidae), and G. C. and J. Wheeler (Formicidae). All specimens, except new specimens, are in the collection of the University of Nevada, Reno.

RESULTS

The most numerous species obtained was the California harvester ant, *Pogonomyrmex californicus* (Buckley), with 26 collections containing hundreds of specimens. One permanent pitfall trap contained over 500 individuals. It was present at both dunes from

May through October. Two other ants were common at SM *Veromessor lariversi* M. R. Smith and *Conomyrma insana* (Buckley). *Glyptacros* new species and *Xeroglypta egyptia* Mickel and Krombein were perhaps the most interesting wasps collected. They both have wingless females and were collected by sifting sand. Other wingless females obtained, mutillids, were found active on the surface or attracted to UV light traps. Next to the ants, the most numerous species were *Parnopes fulvicornis* Cameron (Chrysididae), *Paranistrocerus toltecus* (Saussure) (Vespidae), *Acanthetropis aequalis* (Fox) (Tiphidae), *Sphaerophthalma* sp. (Mutillidae), *Microbembex argyropleura* Bohart and *Eucerceris nevadensis* (Dalla Torre) (Sphecidae), and *Agapostemon melliventris* Cresson and *Dialictus* sp. (Halictidae).

Chrysididae

- Elampus nitidus* Aaron (WUS) SM 3 Aug. Oct.
Holopyga hora Aaron (WUS) SM 1 May.
Hedychridium amabile Cockerell (WUS) SM 5 Aug. Sept.
Hedychridium arietinum Bohart (CA) SM 1 Sept., BSM 1 Sept.
Hedychridium mancopae Bohart (CA) SM 2 April May.
Hedychridium mirum Bohart (CA) SM 14 June July, BSM 1 June.
Hedychridium species (?) BSM 1 June.
Chrysis inflata Aaron (WUS) SM 1 Sept.
Spintharosoma trochilus (duBuysson) (WUS) SM 1 April.
Parnopes fulvicornis fulvicornis Cameron (WUS) SM 132 June July Aug. Sept.

Tiphidae

- Brachysistis lacustris lacustris* Malloch (Mojave desert) SM 3 July Aug. Sept., BSM 9 July Aug.
Brachycistis triangularis Fox (SWUS) SM 4 June, BSM 10 June July.
Brachycistis agama (Dalla Torre) (NA) SM 12 July Aug. Sept., BSM 57 July Aug.
Brachycistis species (?) BSM 9 June.
Colocistis crassa (Bradley) (SWUS) BSM 3 June.

Acanthetropis aequalis (Fox) (WUS) SM 30 July Aug. Sept., BSM 31 July Aug. Sept.
Acanthetropis noctivaga (Bradley) (SWUS) SM 16 July Aug., BSM 6 July Aug.
Glyptacros new species (?) SM 5 Sept. Oct., BSM 16 June Aug. Sept.
Xeroglypta egregia Mickel and Krombein (SoCA) SM 1 Aug.

Mutillidae

Sphaerophthalma species (?) SM 57 June July Aug., BSM 26 June July Aug.
Dasymutilla gloriosa (Saussure) (SWUS) BSM 1 Aug.
Dasymutilla satanas Mickel (SWUS) SM 2 June July.

Scoliidae

Crioscolia alcione (Banks) (SWUS) SM 3 July Aug.

Formicidae

Pogonomyrmex californicus (Buckley) (SWUS) SM 26 May to Oct. BSM 14.
Veromessor lariversi M. R. Smith (WUS) SM 11 June July Aug. Sept., BSM 2 June Aug.
Crematogaster species (?) SM 1 Sept., BSM 1 Aug.
Conomyrma bicolor (W. M. Wheeler) (WUS) SM 2 July Aug.
Conomyrma insana (Buckley) (WUS) SM 15 June July Aug. Sept., BSM 2 Aug.
Camponotus vicinus Mayr (US) SM 5 Aug. Sept.
Myrmecocystus kennedyi Cole (WUS) SM 4 Feb. Aug., BSM 2 Aug.
Myrmecocystus pyramicus M. R. Smith (WUS) SM 3 Aug. Sept., BSM 2 Aug.
Myrmecocystus new species (?) SM 4 April May.

Vespidae

Pterocheilus crispicornis Bohart (SWUS) SM 1 June, BSM 1 Aug.
Pterocheilus diversicolor Rohwer (SWUS) BSM 1 Aug.
Pterocheilus hurdi Bohart (CA) BSM 1 June.
Pterocheilus hirsutipennis Bohart (SWUS) SM 1 May.

Pterocheilus laticeps Cresson (WUS) BSM 1 June.
Pterocheilus tricoloratus Bohart (SWUS) BSM 1 June.
Leptochilus species (?) BSM 1 Aug.
Maricopodynerus maricoporum (Viereck) (SWUS) SM 4 April July.
Stenodynerus percampanulatus (Viereck) (WUS) SM 6 June July Aug. Sept., BSM 8 Aug. Sept.
Parancistrocerus toltecus (Saussure) (WUS) BSM 95 June July Aug. Sept.
Euodynerus annulatus sulphureus (Saussure) (WUS) SM 1 June.
Ancistrocerus acatskill halophila Viereck (WUS) SM 2 Oct.

Pompilidae

Pepsis pallidolimbata pallidolimbata Lucas (WUS) SM 2 Sept., BSM 1 Aug.
Hemipepsis ustulata ochroptera Stal. (SWUS) SM 1 June.
Aporus hirsutus (Banks) (WUS) BSM 2 June Aug.
Evagetes padrinus padrinus (Viereck) (WNA) BSM 9 June Aug. Sept.
Agenioideus biedermanni (Banks) (SWUS) SM 1 Aug.
Episyrion oregon Evans (WNA) SM 1 May, BSM 1 Aug.
Anoplius relativus (Fox) (NA) SM 5 June, BSM 10 June July Aug. Sept. Oct.
Anoplius tenebrosus (Cresson) (NA) SM 1 Sept.
Pompilus orophilus Evans (NA) SM 3 May, BSM 3 Aug.
Pompilus phoenix Evans (WUS) BSM 3 June.
Aporinellus borregoensis Evans (SWUS) SM 1 June.
Aporinellus fasciatus (Smith) (NA) SM 1 June, BSM 1 June.
Aporinellus medianus Banks (NA) SM 12 June July Aug. Sept.
Aporinellus taeniatus taeniatus (Kohl) (NA) Sm 1 Sept.
Aporinellus yucatanensis (Cameron) (NA) SM 1 Sept., BSM 1 June.

Sphecidae

Prionyx canadensis (Provancher) (NA) SM 1 June, BSM 6 June July Aug.

- Prionyx subatratus* Bohart (WUS) SM 1 Aug.
Podalonia communis (Cresson) (WUS) SM 12
 June July, BSM 6 July.
Ammophila aberti Haldeman (WUS) SM 2
 May June.
Ammophila polita Cresson (WUS) BSM 4
 June.
Ammophila pruinosa Cresson (WUS) SM 2
 May Sept.
Ammophila wrightii (Cresson) (WUS) BSM 1
 June.
Mimesa coquilletti (Rohwer) (CA NV) SM 13
 May Sept., BSM 2 June.
Astata bechteli Parker (SWUS) SM 3 June
 July Aug.
Astata occidentalis Cresson (WUS) BSM 9
 June July Aug.
Larropsis washoensis Bohart and Bohart (NV)
 SM 3 May June, BSM 11 June July Aug.
Ancistromma granulosa (Bohart and Bohart)
 (WUS) SM 1 Aug., BSM 1 Aug.
Tachytes ermineus Banks (SWUS) SM 2 June.
Tachytes nevadensis Bohart (WUS) SM 3
 Aug. Sept.
Tachytes new species SM 7 June.
Tachysphex apicalis fusus Fox (NA) BSM 3
 June.
Tachysphex ashmeadii Fox (WUS) SM 7 Aug.
Tachysphex spinosus Fox (WUS) SM 1 June.
Tachysphex species (?) BSM 14 June.
Plenoculus boregensis Williams (SoCA) SM 1
 June.
Pisonopsis species (?) SM 3 May June.
Miscophus species (?) SM 2 May June.
Oxybelus abdominalis Baker (WUS) SM 10
 Aug. Sept., BSM 6 June.
Oxybelus pitanta Pate (SWUS) SM 12 Aug.
 Sept., BSM 2 June.
Crabro opalencens Bohart (WUS) SM 2 May.
Bicyrtes ventralis (Say) (NA) SM 3 Aug.
Bicyrtes capnopteris (Handlirsch) (NA) SM 3
 Aug.
Microbembex argyropleura Bohart (SWUS)
 SM 39 June July Aug. Sept., BSM 15
 July Aug.
Microbembex californica Bohart (SWUS) SM
 1 June, BSM 1 July.
Bembix rugosa Parker (AZ) SM 18 Aug.
Bembix stenobdome Parker (AZ) SM 1 July.
Bembix occidentalis Fox (SWUS) SM 2 June.
Bembix americana comata Parker (SWUS)
 SM 2 Aug. Sept.
- Stictiella corniculata* Mickel (WUS) SM 3
 Sept.
Stictiella nubilosa Gillaspay (SoCA) SM 2 June
 July.
Stictiella speciosa (Cresson) (WNA) SM 1
 Sept.
Glenostictia argentata (Fox) (SoCA) SM 12
 Aug.
Glenostictia megacera (Parker) (WUS) SM 1
 Aug.
Glenostictia tenuicornis (Fox) (SWUS) SM 2
 Aug.
Philanthus crotoniphilus Viereck and Cockerell
 (WUS) SM 19 Aug. Sept.
Philanthus multimaculatus Cameron (WNA)
 SM 13 Aug. Sept.
Philanthus pacificus pacificus Cresson (NA)
 SM 11 July Aug. Sept., BSM 1 June.
Philanthus pulcher Dall Torre (SWUS) SM 1
 May.
Philanthus ventralis (Mickel) (PCS) SM 17
 Sept.
Philanthus zebratus Cresson (WUS) SM 1
 Sept.
Clypeadon evansi Bohart (SWUS) SM 4 July
 Aug.
Clypeadon laticinctus (Cresson) (WUS) SM 8
 Aug.
Clypeadon utahensis (Baker) (SWUS) SM 7
 Aug. Sept.
Clypeadon species (?) SM 1 July.
Cerceris bridwelli Scullen (SoCA AZ) SM 8
 Aug.
Cerceris californica Cresson (WUS) SM 5 July
 Aug.
Cerceris confrons Mickel (WNA) SM 4 Aug.
 Sept.
Cerceris crotonella Viereck and Cockerell
 (WUS) SM 5 June July Aug., BSM 1
 June.
Cerceris echo echo Mickel (WUS) SM 3 July
 Aug. Sept.
Cerceris species (?) SM 1 Aug.
Eucerceris arenaria Scullen (SWUS) SM 9
 Aug. Sept.
Eucerceris nevadensis (Dalla Torre) (WUS)
 SM 74 July Aug. Sept.
- Colletidae
- Colletes mandibularis* Smith (EUS) SM 3
 Sept., *Chrysothamnus viscidiflorus*.

Colletes stевini Cockerell (WUS) SM 4 June July Sept., Chvi, *Psorothamnus polydenius*.

Colletes stephani Timberlake (SoCA) SM 1 June.

Colletes species (?) SM 30 June Aug. Sept., BSM 4 June Sept., Chvi, *Eriogonum keameyi*, Pspo, *Tetradymnia comosa*.

Andrenidae

Andrena (Diandrena) malacothricidis Thorp (SoCA) BSM 2 May, *Malacothrix sonchoides*.

Andrena (Onagradora) chylismiae Linsley and MacSwain (ECA) SM 15 April, BSM 2 May.

Andrena (Onagradora) linsleyi Timberlake (SWUS) SM 5 April.

Andrena (Thysandrena) vierecki Cockerell (GB) BSM 2 June, *Mentzelia albicaulis*.

Nomadopsis (Nomadopsis) puellae (Cockerell) (WUS) SM 7 May June, SM 32 May June, Maso.

Nomadopsis (Micronomadopsis) phaceliae Timberlake (ECA) SM 2 May, BSM 1 June, *Phacelia* sp.

Nomadopsis new species (?) BSM 35 June July, *Psorothamnus kingii*.

Perdita (Cockerellia) utahensis Cockerell (SWUS) SM 16 July Aug., *Helianthus deserticola*.

Perdita (Perdita) lepidosparti Timberlake (GB) SM 11 July Aug. Sept., *Cleome sparsifolia*.

Perdita (Perdita) hirticeps Timberlake (SWUS) SM 16 June July Aug., Chvi, BSM 5 July.

Perdita (Perdita) phymatae Cockerell (SWUS) SM 2 Sept., Chvi.

Perdita (Procockerellia) albonotata Timberlake (SoCA) SM 1 July.

Perdita species 1 (?) SM 84 Aug. Sept., Chvi.

Perdita species 2 (?) SM 1 Aug., Pspo.

Perdita species 3 (?) SM 51 July, *Tiguilia nuttallii*.

Perdita species 4 (?) SM 15 July Aug., Pspo.

Halictidae

Nomia (Acunomia) howardi Crawford (SWUS) SM 2 Aug., Erke.

Agapostemon femoratus Crawford (WNA) BSM 1 June, Clsp, *Sphaeralcea ambigua*.

Agapostemon melliventris Cresson (WUS) SM 73 June July Aug., BSM 2 Aug. Sept., *Atriplex* sp, *Amaranthus* sp, *Camissonia clavaeformis*, Chvi, Clsp, Hede, Erke, *Psoralea lanceolata* Pspo.

Lasioglossum sisymbrii (Cockerell) (WUS) SM 16 April June July Aug. Sept., *Asragalus lentiginosus*, Chvi.

Evylaeus aberrans (Crawford) (WUS) SM 9 May June July, BSM 2 May June.

Dialictus species 1 (?) BSM 5 April.

Dialictus species 2 (?) SM 78 April May June July Aug. Sept., BSM 37 July Aug. Sept., Chvi, Erke, Hede, Psla, *Stephanomeria exigua*, *Tetradymia tetrameres*.

Dialictus species 3 (?) SM 9 Aug. Sept., *Abrionia turbinata*, Asle, Chvi, Erke, *Penstemon acuminatus*, *Phacelia* sp.

Sphcodes species (?) SM 1 Sept.

Melittidae

Hesperapis species (?) SM 22 May, *Phacelia* sp, *Oenothera deltoides*.

Megachilidae

Anthidium rodecki Schwartz (CO NV) SM 15 May June July Aug., BSM 44 July Aug., Psla, Pski, Pspo.

Dianthidium subparvum Swenk (WNA) SM 4, *Chaenactis xantiana*, Chvi.

Anthidiellum notatum robertsoni (Cockerell) (WNA) SM 2 Aug., Psla.

Stelis species (?) BSM 1 June.

Proteriades (Holplitina) bullifacies (Michener) (ECA) SM 3 April May, BSM 5 May June, (Asle) *Phacelia*.

Anthocopa (Eremosmia) robustula (Cockerell) (SWUS) SM 4 April May, BSM 5 June, *Phacelia* sp.

Anthocopa (Eremosmia) timberlakei (Cockerell) (SoCA) SM 28 May June, BSM 15 May June, Asle, Cacl, Meal, Peac, *Phacelia* sp, Pski, Pspo.

Ashmeadiella (Ashmeadiella) aridula Cockerell (WUS) SM 5 Aug., BSM 3 Aug, Clsp, *Phacelia* sp, Psla, Pski, Pspo.

Ashmeadiella (Ashmeadiella) buconis denticulata (Cresson) (WUS) SM 1 June, Pspo.

Osmia (Nothosmia) titusi Cockerell (SoCA) SM 2 April June, Asle, *Phacelia* sp, Pspo.

Megachile (Derotropis) xerophila Cockerell (SoCA AZ) SM 6 May, BSM 3 June, Chxa, Maso.

Coelioxys (Coelioxys) mitchelli Baker (SUS) SM 2 May.

Anthophoridae

Diadasia australis (Cresson) (WUS) BSM 12 June, *Opuntia pulchella*, *Mentzelia albicaulis*, Hede.

Diadasia vallicola Timberlake (AZ CA) SM 16 May.

Synhalonia albescens Timberlake (SWUS) SM 3 May.

Synhalonia primaverais Timberlake (SWUS) SM 30 April May, BSM 4 May June, Asle, Meal, Peac, *Phacelia*.

Synhalonia speciosa (Cresson) (WUS) SM 1 May.

Melissodes (Eumelissodes) bimatrix LaBerge (WNA) BSM 2 Sept.

Melissodes (Eumelissodes) lutulenta LaBerge (WNA) SM 14 June, BSM 2 June July, *Chaetadelpha wheeleri*, Hede, Pspo, Span, Teco.

Melissodes (Eumelissodes) montana Cresson (WUS) SM 39 Sept, BSM 1 Sept, Chvi, Erke.

Anthophora (Anthophora) affabilis Cresson (WUS) SM 31 April May, BSM 3 May, Asle, Cacl, Peac, *Phacelia*.

Anthophora (Anthophora) porterae Cockerell (WUS) SM 39 April May, BSB 9 May June, Asle, Peac.

Anthophora (Anthophora) urbana Cresson (WUS) SM 35 Aug, Sept., BSM 7 Aug, Chvi, Clsp, Erke, Stex.

Anthophora (Micranthophora) hololeuca Cockerell (SWUS) SM 18 June July Aug, BSM 38 June July Aug, Pski, Pspo.

Anthophora (Micranthophora) petrophila Cockerell (SWUS) SM 11 Aug, Sept., BSM 3 Aug, Chvi.

Centris (Xerocentris) californica Timberlake (CA AZ) SM 34 Aug, Sept., Clsp.

Ceratina (Zadontomerus) neomexicana Cockerell (SWUS) SM 10 May June July Aug., BSM 3 June July, Erke, Hede, Maso, Pspo, Stex, Teco.

Apidae

Apis mellifera Linnaeus (world wide) SM 7 April, Asel.

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